CLAIMS

1. A field interpolation method determination device (6,8a) for determining whether to perform either an inter-field interpolation method or an intra-field interpolation method to combine fields of an inputted interlaced signal (Vin) into frames and thereby to provide conversion to a progressive signal (Vpr), the device comprising:

pixel level difference detection means (6,81) for detecting a pixel level difference (SpA) between the input interlaced signal (Vin) and a 1-field delay input interlaced signal (Vd1) obtained by delaying the input interlaced signal (Vin) by one field;

field correlation detection means (6,81,82,83,84) for detecting correlation between the input interlaced signal (Vin) and the 1-field delay input interlaced signal (Vd1) based on the pixel level difference (SpA), and outputting N-1 inter-field correlation determination signals (Df);

inter-field difference storage means (85,86,87,88) for storing the N-1 inter-field correlation determination signals (Df:R1,R2,R3,R4);

field/frame correlation determination means (89,90) for determining, based on a pattern of values (R1,R2,R3,R4) of the N-1 inter-field difference determination signals, whether two sequential fields among the N sequential fields are generated from a same frame or different frames; and

interpolation method determination means (91) for determining, as an interpolation method, inter-field interpolation if the fields are determined to have been generated from the same frame, or intra-field interpolation if the fields are determined to have been generated from the different frames.

2. A field interpolation method determination device (6,8a) according to claim 1, further comprising interpolation method determination delay means (92,93) for delaying a determination of the interpolation method by the interpolation method determination means (91) by a predetermined time period.

3. A field interpolation method determination device according to claim 2, wherein the predetermined time period is determined based on a time lag from when the interpolation method of the inputted fields are determined until an interpolation process is actually performed.

4. A field interpolation method determination device according to claim 3, wherein the predetermined time period is determined to be around 0.5 seconds based on mechanical/electrical characteristics of the field interpolation method determination device and a device which carries out the field interpolation process.

5. A field interpolation method determination device (6,8a) according to claim 2, wherein counter means (92) increments by one count if the fields are determined to have been generated from the same frame, resets a count value (CDs) if they are determined to have been generated from the different frames, or maintains the count value if otherwise, and

the interpolation method determination means (93) selects the inter-field interpolation if the count value (CDs) is greater than a predetermined value, or selects the intra-field interpolation if the count value (CDs) is less than or equal to the predetermined value.

6. A field interpolation method determination device (6,8a) according to claim 1, wherein if the input interlaced signal (Vin) is a 2-3 pulldown signal, N is equal to or more than 6.

7. A field interpolation method determination device (6,8a) according to claim 1, wherein if the input interlaced signal (Vin) is a 2-2 pulldown signal, N is equal to or more than 5.

8. A field interpolation method determination device (6,8a) according to claim 1, wherein if at least two sequential signals among the N-1 inter-field correlation determination signals (R1,R2,R3,R4) indicate absence of correlation, the field/frame correlation determination means (89,90) determines

that the two sequential fields have been generated from the different frames.

9. A field interpolation method determination device (6,8a) according to claim 1, wherein if the N-1 inter-field correlation determination signals (R1,R2,R3,R4) alternately indicate presence and absence of correlation, the field/frame correlation determination means (89,90) determines that the two sequential fields have been generated from the same frame.

10. A field interpolation method determination device (6,8a) according to claim 1, wherein the field correlation detection means (6,81,82,83,84) includes:

pixel difference determination means (82) for determining for each pixel whether the pixel signal level difference (SpA) is greater than a first threshold (X) which indicates a predetermined pixel level and outputting a pixel unit level difference determination result (Dp) represented by a binary value;

field unit level difference determination means (83) for adding one field to the pixel unit level difference determination result (Dp), and outputting a field unit level difference determination result (CDp); and

inter-field correlation determination means (84) for determining whether inter-field correlation is significant based

on whether the field unit level difference determination result (CDp) is greater than a second threshold (Y) indicating a predetermined number of pixels.

11. A field interpolation method determination device (6,8a) according to claim 10, wherein

the inter-field difference determination means (6,81,82,83,84) further includes:

signal level detection means (94b) for detecting a signal level (PL) indicating brightness of an image represented by the 1-field delay input interlaced signal (Vd1); and

first threshold change means (95b) for changing the first threshold (Xb) based on a value of the signal level (PL).

12. A field interpolation method determination device (6,8a) according to claim 10, wherein

the inter-field difference determination means (6,81,82,83,84) further includes:

signal level detection means (94b) for detecting a signal level (PL) indicating brightness of an image represented by the 1-field delay input interlaced signal (Vd1); and

second threshold change means for changing the second threshold (Y) based on a value of the signal level (PL).

13. A field interpolation method determination device

(6,8c,10) according to claim 1, wherein

the inter-field difference determination means (6,81,82,83,84) further includes:

field identification means (10) for outputting, based on the 1-field delay input interlaced signal (Vd1), a field identification signal (Doe) which indicates whether a field of the 1-field delay input interlaced signal (Vd1) is an even field or an odd field; and

an AND circuit (96c) for calculating a logical product (Dfa) of the field identification signal (Doe) and the inter-field correlation determination signal (Df), and outputting the product to the N inter-field difference storage means (85-88).

14. A field interpolation method determination device (6,8c,10,22d,24d) according to claim 13, wherein the inter-field difference determination means (6,81,82,83,84) further includes:

an inverter (22d) for outputting a reversed signal (nDoe) of the field identification signal (Doe); and

a field identification signal reverse switch (24d) for selectively outputting either the field identification signal (Doe) or the reversed signal (nDoe) to the AND circuit (96c).